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Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)	
	)	MM Docket No. 97-217
Amendment of Parts 1, 21 and 74 to Enable	)	
Multipoint Distribution Service	)	
and Instructional Television Fixed	)	File No. RM-9060
Service Licensees to Engage in Fixed	)	
Two-Way Transmissions	)	

COMMENTS OF SPIKE TECHNOLOGIES, INC.

SPIKE TECHNOLOGIES, INC.

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Its Attorneys

January 8, 1998

Before the
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COMMENTS

Spike Technologies, Inc. ("Spike"), by its attorneys and pursuant to Section 1.415 of the Commission's Rules, hereby submits its comments in response to the Notice of Proposed Rulemaking ("NPRM") in the above-captioned proceeding. The NPRM seeks comment on proposed changes to the current ITFS and MDS Rules intended to facilitate the provision of two-way services.[1]

Introduction

Spike is a designer and manufacturer of microwave equipment for two-way wireless communications, with technical facilities located at Nashua, New Hampshire. Spike has worked to refine its proprietary, sectored "PRIZM" antenna and transceiver designs, and has tested a variety of two-way wireless communication system applications and configurations, as well as the integration of advanced computer networking equipment into such systems. Spike operates PRIZM-equipped, multicellular two-way communications systems in Nashua and South America.

The hallmark of Spike's two-way communications systems, its PRIZM base station, creates many narrow, focused beams of RF energy. This permits much greater frequency re-use by dividing

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[1]The NPRM was initiated at the request of over one hundred participants in the wireless cable and related industries, including the Wireless Cable Association International, Inc., wireless cable system operators, MDS and ITFS licensees, equipment manufacturers, engineers, and others (collectively, "Petitioners").

hub station response service areas into twenty or more segments, allowing licensees and operators to maximize service offerings. In addition, due to its modest power requirements and highly directional nature, the PRIZM-based system minimizes the potential for interference.

Spike commends the Petitioners' and Commission's efforts to amend the Rules to facilitate the provision of two-way services over MDS and ITFS frequencies. Spike believes that its own hands-on experience in developing and operating cutting edge two-way systems makes it uniquely qualified to comment on the proposals set forth in the NPRM. Permitting the delivery of advanced services such as high-speed Internet access, telephony, video conferencing and data connectivity over ITFS/MDS channels is critical if wireless operators are to remain viable competitors in what is now a dynamic and fiercely competitive marketplace. The ability to offer such services also will greatly enhance educational opportunities for ITFS licensees and their student and faculty constituencies.

However, the full benefits of two-way technology will never be realized if the rules adopted pursuant to the NPRM do not afford system designers and manufacturers, as well as licensees and operators, the freedom and flexibility to quickly translate technological advancements into robust services, and to tailor systems to meet ever-changing market needs and conditions. Spike believes that this essential freedom and flexibility can be achieved within the framework of the proposed rules, with the refinements discussed below.

Discussion

I. Response Station Hubs Must Be Transmit-Capable for Efficient System Design and Flexibility in Service Offerings

The NPRM proposes the following definition of response station hub:

> A fixed facility licensed for use in accordance with § 21.909 that is operated by an MDS licensee or the lessee of an MDS facility for the reception of information transmitted by one

> or more MDS response stations. A response station hub licensed under this part may share facilities with other MDS response station hubs and/or ITFS response station hubs authorized pursuant to § 74.939.[2]

This definition is unnecessarily restrictive in that it limits response station hubs to the collection of upstream transmissions from response stations. Response station hubs are not allowed to transmit or share facilities with MDS/ITFS booster stations.

In order to design and implement efficient and fully functional *two way* systems, response station hubs must be able to relay and redirect "upstream" transmissions. This critical flexibility can be attained by explicitly permitting such stations to share facilities with MDS/ITFS booster stations, and/or by authorizing response station hubs to retransmit the collected response station transmissions. Spike suggests the following revised definition of response station hub:

> A fixed facility licensed for use in accordance with § 21.909 that is operated by an MDS licensee or the lessee of an MDS facility for the reception and/or retransmission of information transmitted by one or more MDS response stations. A response station hub licensed under this part may share facilities with other MDS response station hubs and/or ITFS response station hubs authorized pursuant to § 74.939 and/or with signal booster stations authorized pursuant to §§ 21.913 and/or 74.985.[3]

The practical benefits of Spike's proposed response station hub definition are illustrated in Attachments A and B hereto. In these examples, the FCC is utilizing the services of the local wireless service provider to link its computer networks and databases at 1919, 2025 and 2033 M Street to create an expanded local area network, or "LAN." Attachment A shows the economy and elegance of Spike's system. With the ability to both receive and transmit, Spike's collocated response station

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[2]NPRM at ¶ 14.

[3]Sections 21.909 and 74.939 would require corresponding revisions. For the purposes of interference calculation, response station hub transmissions should be aggregated with other like-channel transmissions.

hub/signal booster station is the only facility required to instantly integrate communications by and between data systems within the three FCC buildings. In addition, because the response stations are receiving transmissions from and transmitting to the same (hub) location, only one antenna is required per response station, an economic, operational and aesthetic advantage.

Attachment B depicts how this system would have to be structured under the rules as proposed in the NPRM. Under this less flexible scheme, each response station site requires two antennas - one to transmit to the response station hub and another to receive transmissions from the seperate booster station. Also, because the response station hub cannot transmit under the rules as currently proposed, a wired (fiber or coaxial) upstream connection is required between the (receiving) response station hub and the (transmitting) signal booster station. It should also be noted that under the Commission's proposal, local loop (or LAN) transmissions would have to traverse and thus burden the entire wireless network. Under Spike's architecture, local transmissions remain local, resulting in greater speed, efficiency, security and lower cost.

Permitting response station hubs to operate in the manner proposed by Spike will allow two-way systems to be deployed with less equipment and at substantially reduced costs. It also further minimizes the potential for interference as all traffic does not need to be transmitted from a distant, higher-powered (booster) station. The NPRM envisions the "cellularization" of MDS/ITFS service areas in a manner that will necessitate the use of "large numbers"of booster facilities.[4] Spike's operating experience in Nashua and in South America has demonstrated that transmit-capable response station hubs perform well operating at the same low power levels as response stations, and

[4]NPRM at ¶ 33.

that cell size can easily be manipulated by adjusting these modest power levels.[5] Because fewer higher powered booster facilities and transmissions are necessary under Spike's suggested system configuration, less total RF radiation is emitted, and the potential for harmful interference is correspondingly reduced.

Spike's experience in designing and implementing such facilities and systems has proven the efficacy and efficiency of such flexible, two-way use of hub stations. It would be difficult to overstate the importance of this flexibility to the ability of system designers and operators to offer competitive advanced services to the public.[6]

II. Various Methods For Determining Interference Should Be Allowed to Accommodate Differences In System Design And Service Offerings

The NPRM proposes that response station interference calculations be based on a three-step process using statistical analysis and worse case scenarios because specific response station locations will not be known in advance.[7] The last step involves combining the radiated fields of all response stations within each service area. This approach is based in part on the assumption that the distribution of response station transmitters will closely match population distribution within service

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[5]Spike has achieved service areas with a 26-mile radius with bi-directional hub transmissions of less than +17dBW. The larger the areas to be served, the fewer number of total boosters required.

[6]Attachment C hereto depicts the configuration of Spike's multicellular South American wireless communications system. It is important to note that the ability of hub facilities to receive and transmit is also critical to the linking of such facilities through a "wireless backbone," and thus to the successful cellularization of the entire communications system. Spike's South American facilities are currently used to provide high-speed wireless Internet access and video conferencing services.

[7]NPRM at ¶ 34.

areas, and that all response station transmitters will be active at all times for all system architectures.

These assumptions will not hold true in all cases, and licensees and operators should not be restricted to an interference calculation method that will not result in a meaningful analysis. In such cases, licensees and operators should be able to demonstrate compliance with the interference protection standards by alternate means.

To illustrate, through practical experience, Spike has found that it can serve an entire multiple dwelling unit ("MDU") with a single, multi-user, roof-mounted transceiver. This allows literally hundreds of subscribers to be served using only a handful of response station transmitters. Thus, where a wireless service provider chooses to target MDU customers, or in regions where a significant portion of the population resides in MDU's, there may be little or no correlation between population density and the number of response stations needed to provide comprehensive service.

Similarly, many of the advanced services that can be provided over two-way systems - such as video conferencing and data connectivity and storage - will be subscribed to almost exclusively by businesses, universities, hospitals and the like, at least initially. Again, there is likely to be little or no correlation between population density and the likely distribution of customers for these services.

Also, the interference calculation methods proposed in the NPRM seems to assume that all MDS two-way systems will operate with all response station transmitters transmitting at the same time. This is true in the case of systems utilizing Code Division Multiple Access ("CDMA") protocol. For CDMA-based systems, it does indeed make sense to assign multiple response station transmitters to the grid of points developed for each service area.

In Spike's current two-way systems, however, a Time Division Multiple Access ("TDMA") control protocol is used. In TDMA systems, only one response station in each sector of a given

service area is transmitting at any given moment. Consequently, an interference calculation method that assigns a single response station transmitter in a sector to multiple grid points is clearly not appropriate for a system using TDMA.

While Spike does not oppose the proposed three-step process and attendant assumptions for establishing compliance with the interference standards, this should not be the *only* method available to applicants to demonstrate that the interference criteria will be met. As long as the applicant adequately describes the proposed system and facilities, the actual interference calculation procedures used, the service(s) to be provided and any assumptions made in the analysis, the Commission should allow flexibility as to the method used to show compliance with established interference criteria.

Conclusion

Spike believes that the proposals set forth in the NPRM, refined to incorporate the additional flexibility of transmit-capable response station hubs and interference calculation methods that can be tailored to reflect real-world considerations would greatly facilitate the use of ITFS and MDS frequencies for the provision of advanced two-way services. ITFS and MDS licensees, system operators, designers, equipment manufacturers, and - most importantly, the public - will all reap the resulting benefits.

Respectfully submitted,

SPIKE TECHNOLOGIES, INC.

By: _____

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January 8, 1998

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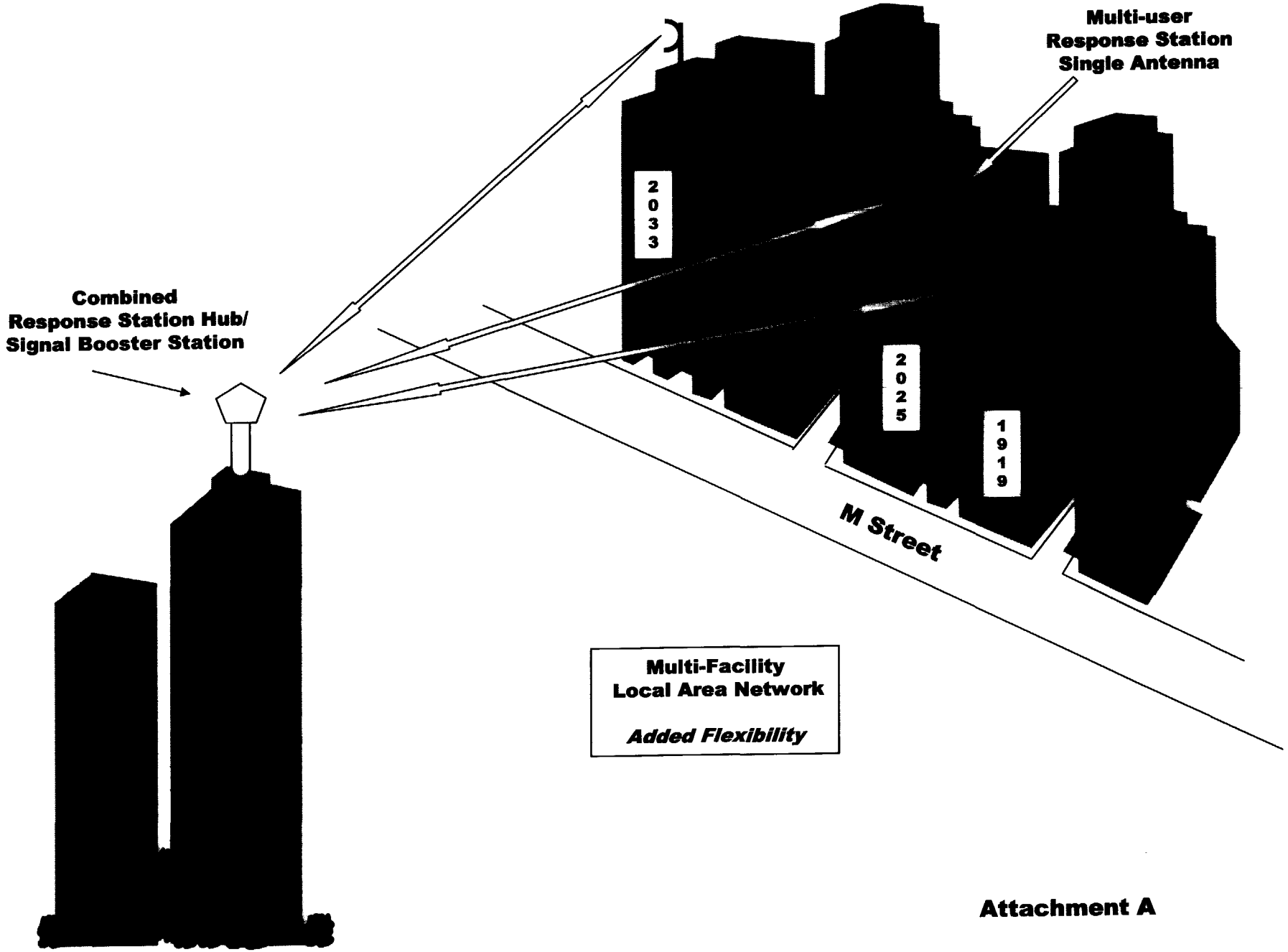
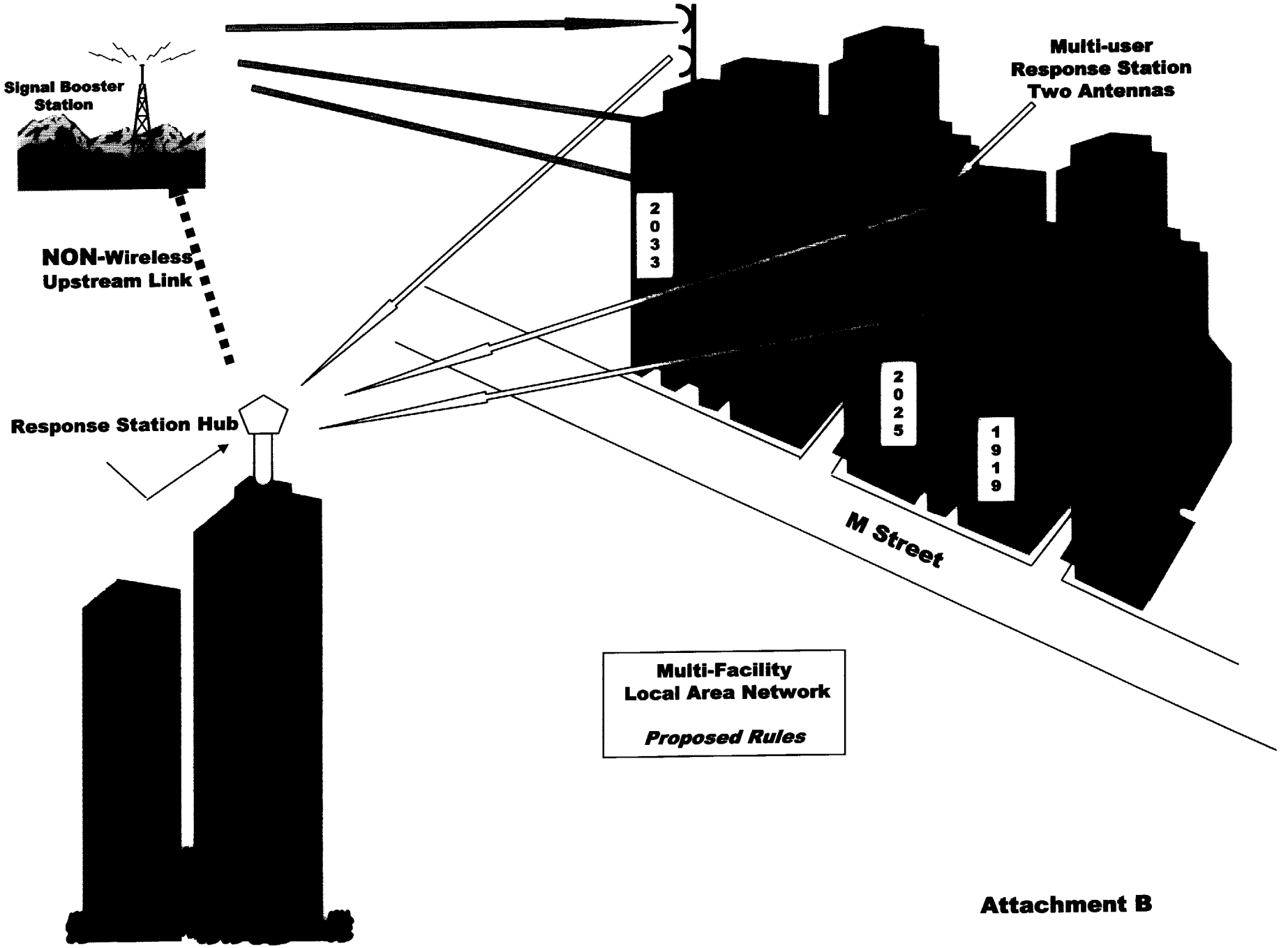


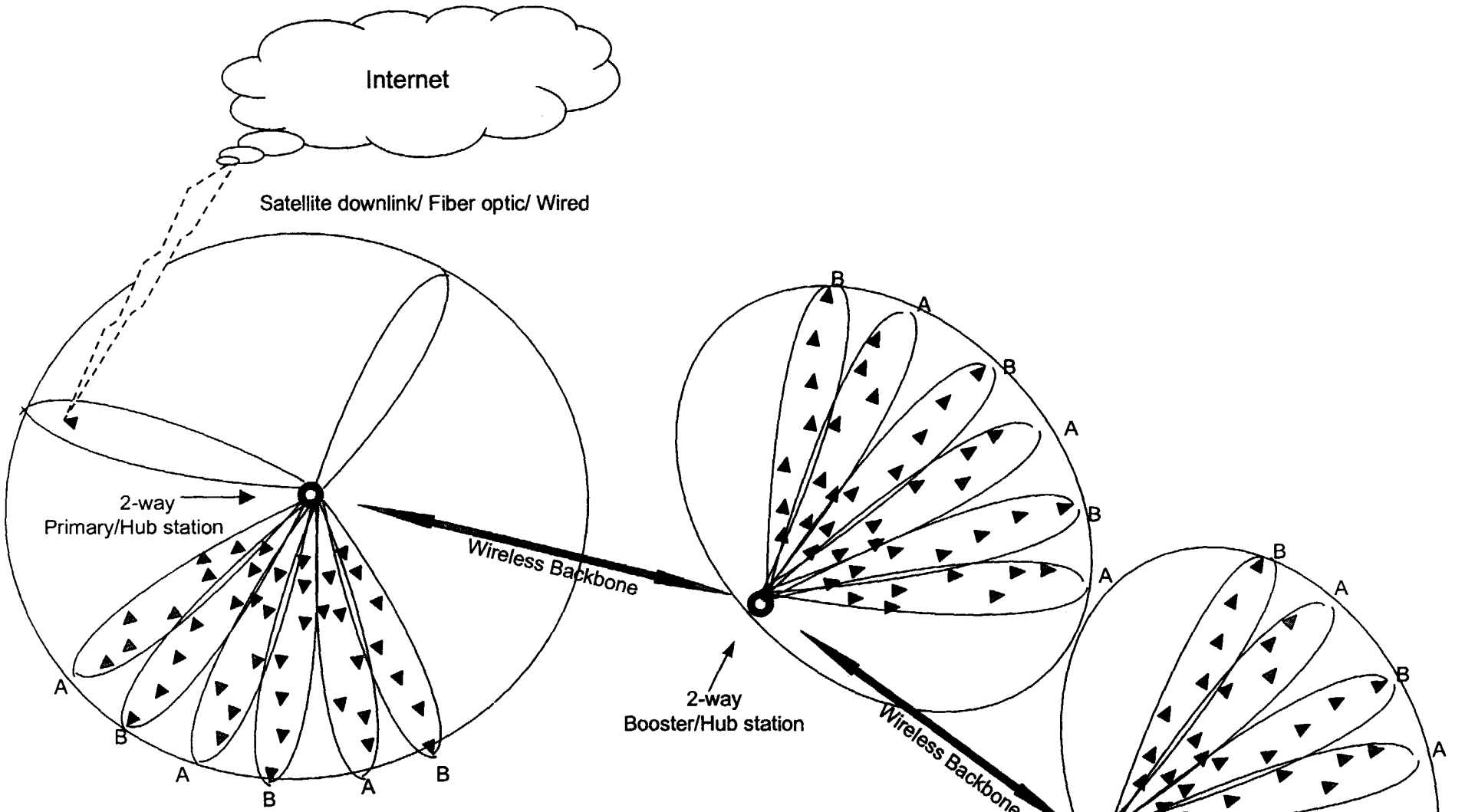
Attachment A



Multi-Facility Local Area Network

Proposed Rules

Attachment B



Notes:
Not all possible sectors drawn.
Channel scheme for illustration only.
Flux density and 45, 0 D/U ratios apply.
▲ = Response Station

Example channel arrangement

A sectors:	E1 downstream, E4 upstream
B sectors:	F4 downstream, F1 upstream
Wireless Backbone:	G4 downstream, G1 upstream

Attachment C

CERTIFICATE OF SERVICE

I, Victor Onyeoziri, with the law firm of Rini, Coran & Lancellotta, P.C., do hereby certify that I have this 8th day of January, 1998 caused to be delivered by hand the foregoing "Comments" of Spike Technologies, Inc. to the following:

The Honorable William E. Kennard
Chairman
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1919 M Street, N.W., Room 814
Washington, D.C. 20554

The Honorable Susan Ness
Commissioner
Federal Communications Commission
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The Honorable Harold W. Furchtgott-Roth
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The Honorable Michael K. Powell
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The Honorable Gloria Tristani
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